Doe Run
Herculaneum Smelter

Site Background, History, and Present Activities in Herculaneum

Lead Production in Missouri

- Missouri lead producing districts among the largest in the world
- Exploration, mining, processing began in early 1700s and continues to today
- Historic areas: Tri-State District, Old Lead Belt, Central District, others
- Current production in the Viburnum Trend
- Lead concentrates from mine/mill facilities are transported ~40 to 80+ miles to smelters

Lead Production in Missouri

- The Doe Run Company owns/operates all active lead-producing facilities in Missouri
- Six mine/mill facilities (two idle/closed), two primary smelters, one secondary smelter
- Doe Run/St. Joe Minerals has environmental responsibilities at current and historic operations

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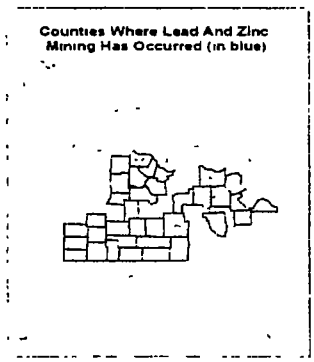
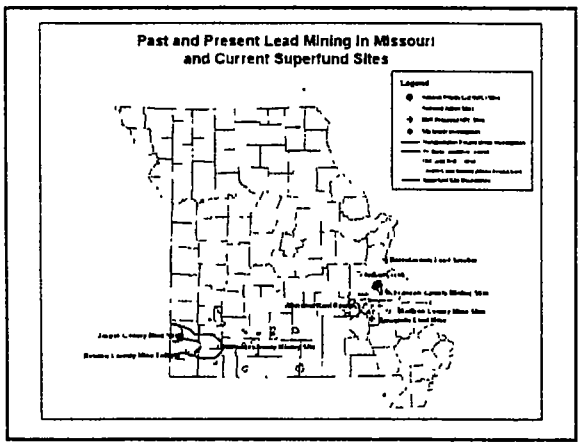
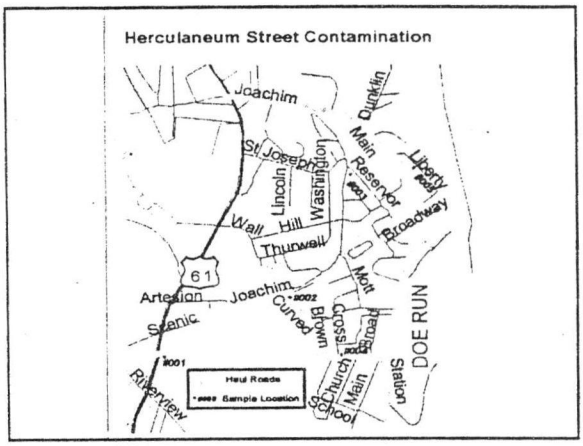




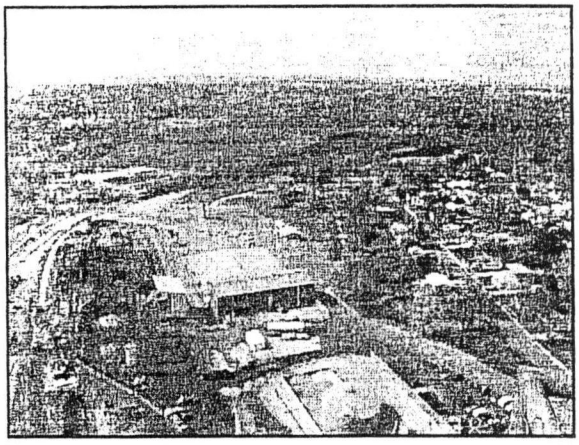
The Herculaneum Smelter

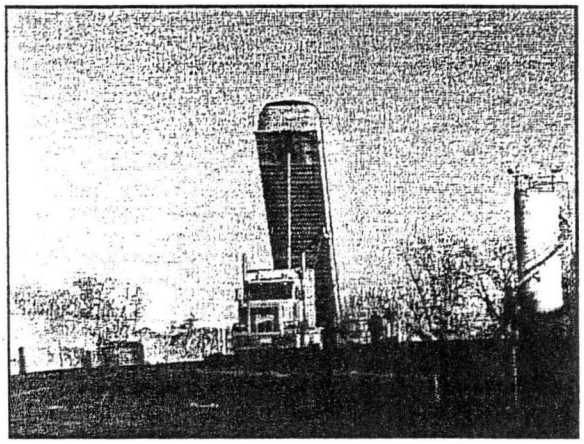
- Began operation in 1892
- One of the largest smelters in the world
- 52 acre facility
- 24 acre slag pile
- Various ownership: St. Joe Minerals, Fluor Corporation
- Currently owned by The Doe Run Company, owned by Renco Group, Inc.

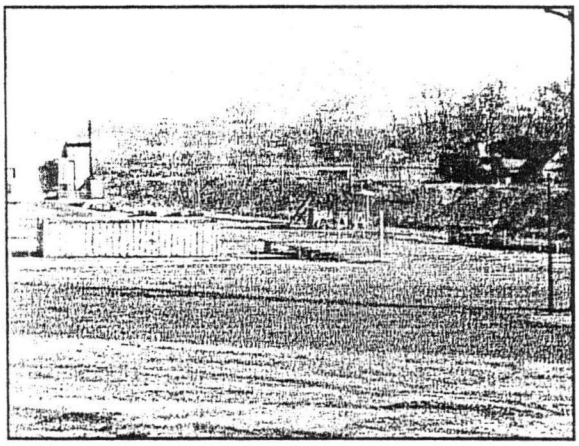


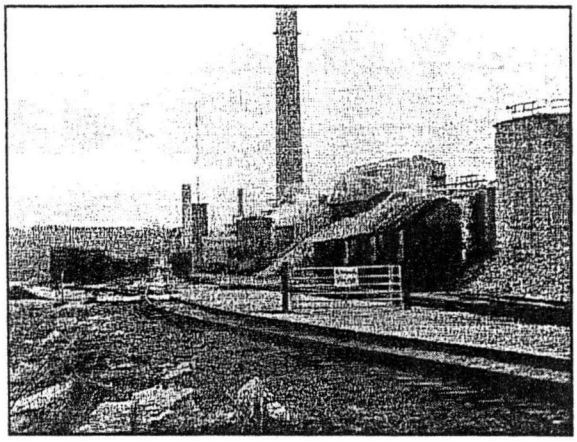
Smelter Process Overview

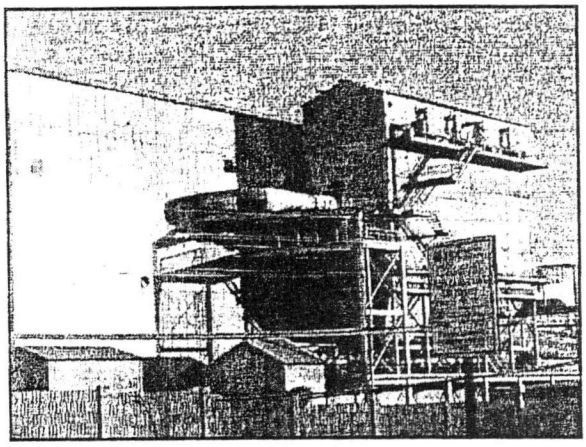
- Lead concentrate (PbS), slag, flux, other LBM are roasted in sintering plant producing PbO sinter
- Sinter charged into blast furnace with coke & additional flux
- Molten lead & slag tapped from bottom of furnace
- Molten lead is transferred to dross plant to cool - copper & other impurities are skimmed off the top
- Molten lead is transferred to refinery kettles where silver & zinc are removed
- Lead is further refined to remove final impurities & cast into lead and lead alloy products

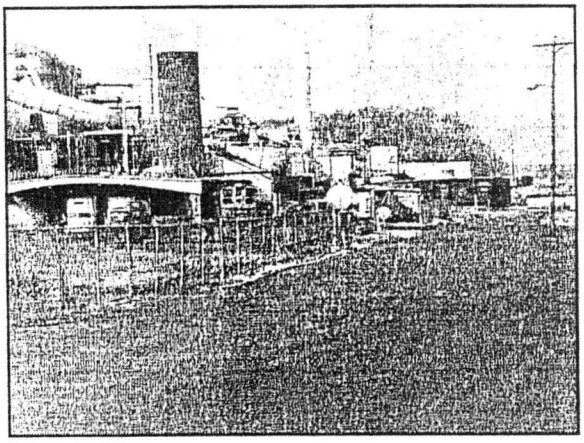






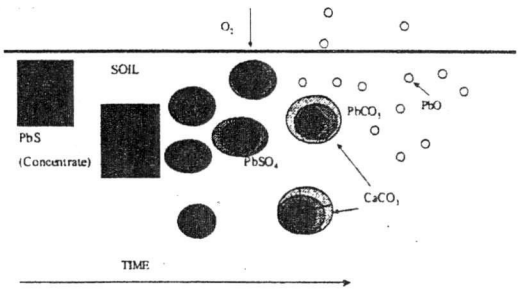






Sources of Smelter-Related Contamination

- Lead concentrate transportation - road dust
- On-site materials handling (sinter, fume, dross, flux, slag, coke, cleanup & maintenance materials, acid, wastes)
- Track-out of contamination from facility
- Stack and fugitive air emissions from production processes
- Redistribution through environmental and mechanical processes



Theoretical Missouri Pb-contaminated Soil Through Time

Public Health and Environmental Concerns

- Lead release & exposure through air emissions
- Lead release & exposure through residential soils & interior dust
- Lead release & exposure through transportation & material handling processes
- Lead, zinc, cadmium, etc. release & exposure to the ecosystem from slag pile, contaminated soil, surface water runoff
- Storm water

Air Emissions

- 1978 lead air quality standard set at 1.5 ug/m^3
- 1980 State Implementation Plan (SIP) negotiated
- Correlation between air emissions and blood lead
- SIP revised in 1984, 1990, 1993 and 2000
- 1997 replaced 350 foot brick stack with 550 foot concrete stack
- Doe Run completed installation of $12M of facility controls in July 2002 - has met lead NAAQS for 3 consecutive quarters

Air Monitoring

- 8 high-volume air monitors installed to track lead emissions
- 6 stations, present for 20 years, have met standard for 8 consecutive quarters
- Broad Street station installed in 1992 had never met standard until last three quarters - now monitored daily
- SO_2 emissions within federal standard, anecdotal evidence of a problem - correlating complaints with data

Residential Soils

- Correlation of elevated blood-lead and contaminated soils
- Average lead concentration within 1/4 mile of the smelter is 3014 ppm
- 1/4-1/2 mile - lead concentration is 1791 ppm
- 1/2-1 mile - lead concentration is 767 ppm
- Safe lead level range is from 240-800 ppm

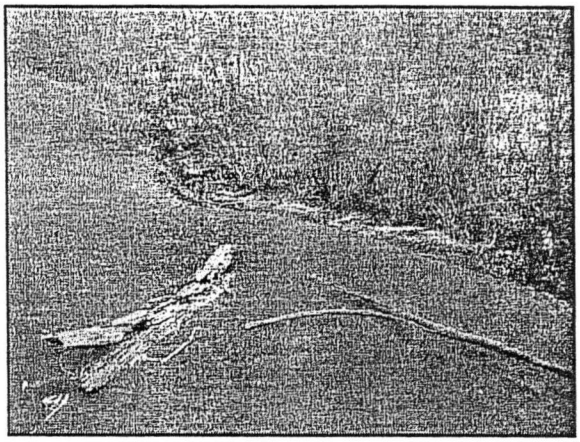
Doe Run Residential Soil Replacement

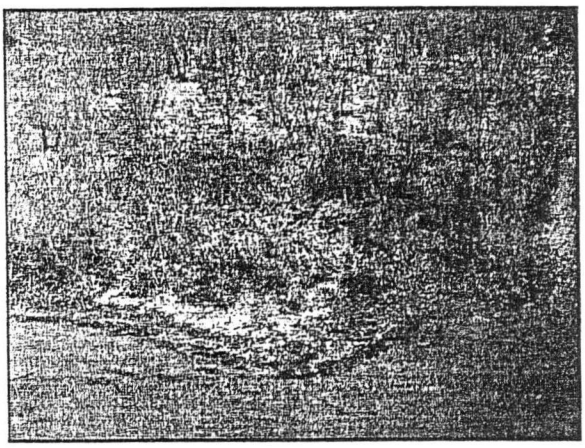
- Company voluntarily replaced contaminated soil from 115 properties starting in 1991
- Accelerated soil replacements required by AOCs
- Excavate soil to 1 foot and replace with clean soil and sod
- Replace flowers, trees and shrubs

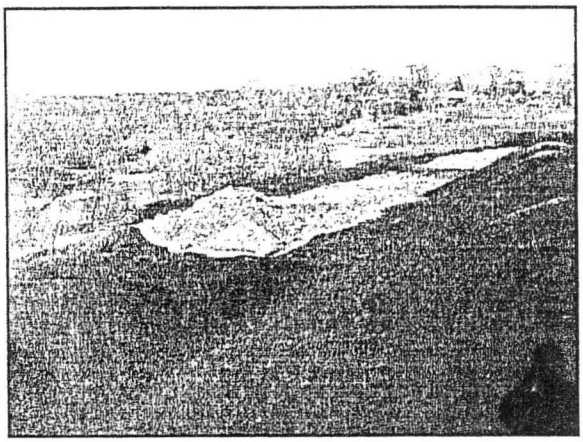
Slag Pile - Ecological Impacts

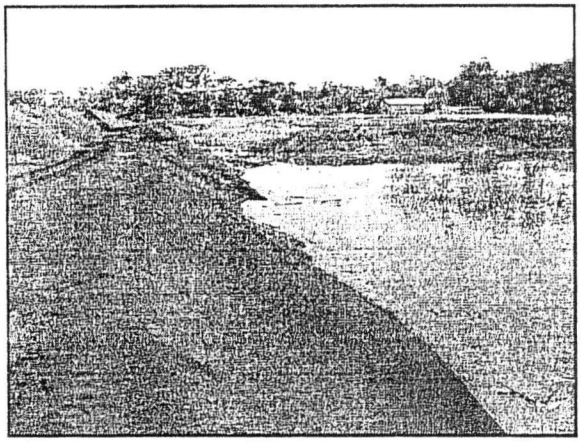
- Slag higher in zinc relative to lead
- Slag pile is in Joachim Creek flood plain/ wetland - endangered species and migratory waterfowl habitat
- Storm water infiltrates and exits toe of slag pile, flood water contacts slag pile
- Contaminated floodplain soils, surface water, and sediments
- Elevated lead in fish, bird, and mouse tissue samples

Aerial Photo of the Herculaneum Smelter and Slag Pile









Surface Water

- Mississippi River & Joachim Creek water & sediment impacted by facility discharges/runoff, slag pile & haul route runoff
- 5 miles of Mississippi River proposed for 2002 Section 303(d) List - public comment period to June 30, 2003
- DNR State Operating Permit effective February 28, 2003
  - Process wastewater & storm water treated in on-site waste water treatment plant
  - Emergency storm water overflow
  - Acid plant non-contact cooling water
  - Storm water runoff from slag pile
  - Storm water runoff from railroad tracks & flood plain east of facility
  - Permit incorporates AOC requirements

Groundwater

- 14 monitoring wells surrounding slag pile contain low levels of contamination
- Flow is generally toward the Mississippi River
- Herculaneum municipal well 1/3 mile north of site in deeper aquifer
- 12 private wells within 1 mile
- Groundwater Monitoring Plan required by AOC

Administrative Order on Consent

- In May 2001, EPA, DNR, Doe Run finalized a comprehensive AOC requiring:
  - Reduction of air emissions to below National Ambient Air Quality Standards by August 14, 2002
  - Investigate and clean up all contaminated residential properties
  - Investigate and control ecological and groundwater impacts from the slag pile
  - Investigate any other areas impacted by operations from the facility

Administrative Order on Consent

- In December 2001, EPA and Doe Run finalized an AOC requiring:
  - Accelerated residential soil cleanup program
  - Home interior dust cleaning
  - Transportation and Materials Handling Plan
- DNR did not sign this AOC

Current AOC Actions

- Residential soil cleanups at a pace of 60 yards per year
- Interim Slag Pile Runoff Control Plan
- Transportation and Materials Handling Plan/Haul Route
- Interior dust focus group considering a site specific cleanup standard
- Recontamination sampling
- Health education
- Other plans are pending review

Order to Abate Violations

- In August 2001, DNR found high concentrations of lead (300,000 ppm) in city street dust
- DNR issued Order to Abate Violations September 25, 2001, citing violations of state Hazardous Waste Management, Air Conservation, and Clean Water Laws
- Order included truck washing, street cleaning, and other corrective actions
- DHSS child blood lead studies factored into DNR response actions

State Settlement Agreement

- Voluntary Property Purchase - 160 residences close to smelter. $1M suspended penalty. Reoccupancy?
- Target: 80% rail delivery of concentrates by April 26, 2003
- Transportation and Materials Handling Plan to resolve violations of Order to Abate Violations pursuant to EPA approval
- New concentrate truck haul route through Herculaneum

Buyout Zone and Haul Routes

Status of Settlement Agreement Actions

- Doe Run has contacted 41 residents about Voluntary Property Purchase
- 16 residential properties have been purchased by Doe Run; 18 more are being evaluated
- In 2002, Doe Run offered to purchase all residential properties with children <6 years of age
- Approximately 67 properties will receive offers in 2003, prioritized based on proximity to smelter
- The remainder of properties will receive offers in 2004

Status of Settlement Agreement Actions

- Doe Run did not achieve 80% rail transport of concentrate by April 26, 2003
- EPA and DNR have been working with Doe Run to significantly modify Transportation and Materials Handling Plan, and operations
- Work continues on possible new haul route removing concentrate transportation from residential areas of Herculaneum

Questions???